Environment Canada

Conservation and Protection

Environnement Canada

Conservation et Protection

Western and Northern Region

Région de l'Ouest et du Nord

Environmental Protection

Protection de l'environnement

Canada

By

Environment Canada
Conservation and Protection
Environmental Protection
Saskatchewan District Office

and

Health and Welfare Canada
Medical Service Branch
Saskatchewan Region

July, 1988

Community Wastewater and Solid Waste Management Practices on Saskatchewan Indian Reserves: An Environmental Compliance Evaluation

Report CP(EP) WNR 88/89-2

ABSTRACT

Wastewater treatment facilities and solid waste management practices on 37 Saskatchewan Indian Reserves were reviewed to ascertain their compliance with applicable environmental guidelines. This evaluation was subjectively performed using available information but without effluent data. One-quarter of the wastewater facilities need to be brought into compliance if potential health and environmental threats are to be minimized. One-third of the solid waste practices were considered deficient, primarily due to untidy disposal sites resulting from open dumping and poor utilization of the trenches. The solid waste deficiencies should be corrected to reduce indiscriminate dumping of refuse.

TABLE OF CONTENTS

ABSTRACT i
TABLE OF CONTENTS ii
APPENDICES iii
TABLES iii

1.0 BACKGROUND 1

2.0 PURPOSE 1

3.0 COLLECTION AND EVALUATION OF DATA 2

4.0 RESULTS AND DISCUSSION 2
4.1 Community Wastewater Facilities 2
4.2 Community Solid Waste Practices 4

5.0 RECOMMENDATIONS 5

6.0 REFERENCES 6

APPENDICES

Page

APPENDIX 1 AN EVALUATION OF WASTEWATER FACILITIES..... 7

APPENDIX 2 COMMENTS ON REPORT FINDINGS BY INDIAN AND NORTHERN AFFAIRS 10

APPENDIX 3 AN EVALUATION OF SOLID WASTE PRACTICES 13

TABLES

TABLE 1 WASTEWATER COMPLIANCE SUMMARY 3

1.0 BACKGROUND

In February 1984, a Memorandum of Understanding was signed between the Departments of Health and Welfare, Environment, and Indian and Northern Affairs, which defined respective departmental roles and responsibilities in providing water, wastewater and solid waste services on Indian Reserves. Under this agreement, Indian and Northern Affairs is responsible for conducting the monitoring and surveillance program of sewage facilities. Inspections of domestic sewage systems and solid waste disposal sites are the responsibility of Health and Welfare Canada. Environment Canada's role is to develop and coordinate the implementation of federal environmental requirements on Indian Reserves. Technical committees comprising representatives of the three Departments were established in each region to implement the principles of this agreement. In keeping with this agreement and departmental mandates, Environment Canada and Health and Welfare Canada conducted a joint audit of community wastewater and solid waste facilities and practices on Saskatchewan Reserves.

2.0 PURPOSE

This report evaluates community wastewater facilities and solid waste management practices on 37 of the 79 Indian Reserves in Saskatchewan. For this review, community wastewater systems were defined as those that serviced either public buildings or

public buildings and domiciles. The remaining reserves will be evaluated and reported by November 1988. The environmental and human health merits of various sewage systems are reviewed to guide Indian and Northern Affairs and Bands in their future selection of sewage facilities

3.0 COLLECTION AND EVALUATION OF DATA

Site inspections were conducted and historic files were reviewed, from July 1986 to July 1987, by Environmental Health Officers of Health and Welfare Canada. The data were compiled by Environment Canada using the following guidelines: 1) Environment Canada's "Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments" (EPS 1-EC-76-1); 2) Indian and Northern Affairs' "Wastewater Collection, Treatment, and Disposal" (DRM/GM 10-7/41); and 3) Indian and Northern Affairs' "Solid Waste Collection and Disposal" (DRM/GM 10-7/42). The evaluation of the community wastewater facilities was subjective and did not involve environmental sampling.

4.0 RESULTS AND DISCUSSION

4.1 Community Wastewater Facilities

Thirty-three wastewater facilities were evaluated (Appendix 1). Twenty-four were in compliance with the guidelines. The types of facilities and compliance statistics are summarized in Table 1.

Three facilities present a health risk and should be corrected immediately. These facilities are at Black Lake, Fond du lac, and James Smith Reserves. The remainder should be brought into compliance as soon as possible. Indian and Northern Affairs has indicated, in Appendix 2, that most of the facilities not in compliance are currently under investigation.

TABLE 1 WASTEWATER COMPLIANCE SUMMARY

System Type	Number of Facilities	Number Not In Compliance	Basis For Noncompliance
mechanical plant	3	2	-poor operation and maintenance
tile field	2	1	-sewage overflow
single cell lagoon	2	1	-surface release requires 2 cells
multi-cell lagoon	23	4	-sewage through berms -continuous discharge -poor operation
spray jet	2	0	
holding tank	1	1	-sewage overflow
Total	33	9	

The purposes of a community sewage system are: 1) isolation of sewage from human and environmental contact; 2) contained treatment; and 3) controlled release of treated effluent.

Low maintenance systems such as two-cell lagoons and sewage mounds are preferable to more sophisticated systems like mechanical plants. Where environmental conditions dictate the use of these sophisticated systems, the costs of long-term

maintenance must be provided. The data show that two of the three mechanical plants are out of compliance, and that the one at Beauval has been so since it was first inspected in 1977. Even simple systems are not without their problems. The supplement to the Saskatchewan Public Health Act (1977) stipulates that spray jets can not serve more than a single dwelling located on a parcel of land containing at least 16 hectares. Improperly located, these mechanisms can expose humans, particularly children, to sewage contamination.

4.2 Community Solid Waste Practices

Solid waste disposal on Saskatchewan Reserves is generally a litter control problem. Poorly maintained sites can, however, present health and safety problems and good practices should be established now before new developments exacerbate the situation.

Solid waste disposal practices were evaluated on the basis of four factors: 1) a regular community garbage collection service; 2) proper siting of disposal sites; 3) satisfactory operation and maintenance of disposal sites; and 4) the closure of inactive sites. Only fourteen of the thirty-seven reserves reported provided all of these (Appendix 3). Most of the deficiencies stemmed from the operation of untidy disposal sites due to the lack of trenches or the improper use of trenches. Although an untidy site does not necessarily pose an environmental or public health concern, it can lead to indiscriminate dumping practices.

Nine reserves should close their inactive sites by back-filling with earth and posting closure signs. Eleven reserves need to establish a garbage collection service.

5.0 RECOMMENDATIONS

Indian and Northern Affairs should implement the following recommendations to remedy the deficiencies identified in this report:

1) Immediately upgrade wastewater treatment systems on Black Lake, Fond du lac and James Smith Reserves because of dangers to human health;

2) Upgrade the remaining wastewater systems not in compliance with the guidelines;

3) Encourage the use of low maintenance sewage systems such as two-cell lagoons and sewage mounds where conditions permit;

4) Actively assist in establishing regular garbage collection services and in closing inactive disposal sites;

5) Actively participate in establishing new disposal sites as required; and

6) Provide advice to Bands seeking technical assistance in improving their solid waste management practices.

6.0 REFERENCES

Environment Canada. 1976. "Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments." EPS 1-EC-76-1, 17 p.

Indian and Northern Affairs Canada. 1984. "Solid Waste Collection and Disposal". DRM/GM 10-7/42, 23 p.

Indian and Northern Affairs Canada. 1984. "Wastewater Collection, Treatment, and Disposal". DRM/GM 10-7/41, 80 p.

APPENDIX 1

AN EVALUATION OF WASTEWATER FACILITIES

FORT QUAPPELLE ZONE OF MEDICAL SERVICES

Reserve	System Type	Facilities Served	Surface Discharge	Satisfactory Compliance Status	Comments on Compliance Status
Cote	2 cell lagoon	50 Village Homes, Arena, Band office, Nursery & Community Bldgs.	No	Yes	-Lagoon overgrown and unattended
Cowessess	2 cell lagoon	School, Village	No	Yes	-Confirm no discharges occur
Kahkewistahaw	2 cell lagoon	Band office, 15 Houses, Arena, Store	No	Yes	
Keeseekoose	2 cell lagoon	20-30 Homes	No	Yes	
Sakimay	2 cell	Band office, Clinic, School, Arena, 11 Houses, Community Centre	Unknown	Yes	-1 foot of liquid in 2nd cell

NORTH BATTLEFORD ZONE OF MEDICAL SERVICES

Beauval	Extended Aeration	Students Residence, 10 Residences	Yes	No	-Periodic overloads occur -Plant has been in non-compliance since 1977
Big C	2 cell lagoon	School, Band Office, Clinic, 2 Trailers, Homes, 2 Teacherages, Firehall	No	Yes	-Second cell nearly dry
Buffalo River	2 cell lagoon	35 Homes, Clinic, School Cafe	Yes	No	-Violates annual retention criteria of guidelines because of continuous discharge
Canoe Lake	2 cell lagoon	School, Clinic, 46 Homes, 4 Teacherages	No	Yes	-2nd cell dry
Island Lake	2 cell lagoon	School, Arena, 5 Teacherages, Firehall	No	Yes	-Fence and road need repair
Joseph Bighead	2 cell lagoon	School, Band Office, Laundromat, Clinic, 1 Home, 3 Trailers, 2 Group Homes, 17 Holding Tanks	Yes	Yes	-Fence needs repair
English River	3 cell lagoon	45 Houses, School, Clinic, Band Office, 8 Residences	Yes	No	-Violates annual retention criteria of guidelines because of continuous discharge
Poundmaker	2 cell lined lagoon	School, Admin. Bldg., 4 Teacherages, 2 Homes	Yes	Yes	
Thunderchild	2 cell lagoon	2 Schools, Band Office, Clinic, 20 Homes, 8 Teacherages	Yes	Yes	
Turner Lake	3 cell lagoon	School, Clinic, 30 Homes	Yes	Yes	-Provincial lagoon
Waterhen	2 cell lagoon	School, Arena, Band Office, Clinic, 4 Residents, 2 Trailers	No	No	-Beavers in lagoon

PRINCE ALBERT ZONE OF MEDICAL SERVICES

Reserve	System Type	Facilities Served	Surface Discharge	Satisfactory Compliance Status	Comments on Compliance Status
Big River	2 cell lagoon	School, Arena, Teacherages, Clinic	Yes	Yes	
Black Lake	Tile field	Band Office, Clinic, Teacherages	Yes	No	-Overflow caused from debris placed in manholes. Violation of provincial regulation as it is well within 500 ft. of lake. Vehicle traffic over tile may have damaged system.
Cumberland	2 cell lined lagoon	Village Area, School, Homes Band Office	Yes	Yes	-Excessive vegetation growth on berms
	2 cell lined lagoon	Portage Area, Homes	Unknown	Yes	-Satisfactory operation
Fond du lac	2 cell lagoon	Band Office, Clinic, Teacherages, R.C.M.P. Bldg.	Yes	No	-Berm failures have allowed the release of untreated sewage to the lake. Berm deterioration is from skiddoos and no maintenance.
James Smith	Holding tanks	Band Office, Nursery School Clinic, Arena	-	No	-Arena tanks often overflow when hockey tournaments are held.
	3 cell lagoon	High school, Above Facilities	Unknown	Yes	-Lagoon constructed in 1986
Lac La Hache	Tile Field	Clinic	No	Yes	-System installed in 1986 - no known problems
John Smith	Spray Jet	Band Office	Yes	Yes	-System only 100 yds. from nearest building
Pelican Lake	1 cell evaporation lagoon	Clinic, Band Office, School, Teacherages	No	Yes	-Vertical berms and no fencing are a safety hazard.
Red Earth	RBC	School, Teacherages, R.C.M.P., Clinic, 2 Homes, Band Office	Yes	Yes	-RBC operation appears satisfactory
	2 cell lagoon	School Education Bldg.	Unknown	Yes	-Vegetation growth in both cells - garbage
Sandy Lake	RBC	School, Arena Office, Clinic, 17 Homes	Yes	No	-RBC in need of maintenance
Shoal Lake	1 cell lagoon	School, Teacherages, Clinic	Yes	No	-Lagoon only 200 feet from school -Condition of gate and fence is poor. Guidelines require 2 cell lagoon
Sturgeon	2 cell lagoon	School, Clinic Band Office	Yes	Yes	-Lagoon not maintained
Wahpeton	2 cell	Band Office, Clinic, 6 Homes, School	Yes	Yes	
Witchekan Lake	Spray Jet	Band Office, Clinic	Yes	Yes	-System only 100 yds. from nearest building

APPENDIX 2

COMMENTS ON REPORT FINDINGS BY INDIAN AND NORTHERN AFFAIRS

COMMENTS ON WASTEWATER SYSTEMS

Patuanak (English River)

Sewage treatment and disposal study to be undertaken in 1988.

Black Lake

Sewage collection, treatment and disposal study to be undertaken in 1988.

To our knowledge, there is no backup in the tile field. The debris in the manholes is in the outfall section to the sewage lagoon, which has not been in service for some time.

Fond Du Lac

Engineering study presently underway to evaluate cost of refurbishing existing lagoon vs. construction of a new lagoon in another location.

James Smith

No gravity sewer system nor sewage treatment exists at the old settlement, and the costs benefit ratio of constructing such facilities would be very high. Perhaps more holding tanks should be installed by the Band, or pumpouts scheduled more exactly.

Lac La Hache

Design of new water and sewerage systems is presently underway to serve the school, presently under construction, as well as the clinic.

Muskoday

Engineering study presently underway to service east side of the Reserve including the Band Hall, with proper water and sewerage systems.

Pelican Lake

Funding for berm repair was provided in 1987. This is a single cell evaporation lagoon.

Sandy Lake

New sewage pumping station, forcemain and 2-cell lagoon presently under construction.

Shoal Lake

Construction now starting on new sewage collection and disposal system.

Witchekan Lake

Design of a new sewage collection , treatment and disposal system has been completed.

APPENDIX 3

AN EVALUATION OF SOLID WASTE PRACTICES

FORT QU'APPELLE ZONE OF MEDICAL SERVICES

Reserve	Regular Community Collection Service	Adequate Site Operation & Location	Old Sites Adequately Covered	Comments
Cote	Yes	No	No	-No all-weather road -Active site untidy
Keeseekoose	Yes	No	Yes	-No all-weather road -Active site untidy
Key	No	No	Yes	-No all-weather road -Active site 100 yds. from lake -Site untidy -Site full - new site needed
Nikaneet	No	Yes	Yes	
Pasqua	No	No	Yes	-Active site untidy
Peekeekisis (west of church)	No	No	No	-Active site untidy and too small
(west of reserve)	No	No	Yes	-Active site untidy and too small
Piapot	Yes	No	No	-No all-weather road -Active site untidy
Standing Buffalo	No	Yes	Yes	
Star Blanket	No	Yes	Yes	-Bulky objects should be segregated from refuse
White Bear (Village Dump)	No	No	Yes	-Active site untidy -No all-weather road
West dump	No	No	Yes	-Active site untidy -No all-weather road
East dump	No	No	Yes	-Active site untidy -No all-weather road

NORTH BATTLEFORD ZONE OF MEDICAL SERVICES

Beauval	Yes	No	Yes	-New trench needed
Big C	Yes	Yes	Yes	
Buffalo River	Yes	Yes	Yes	-New site
Canoe Lake	Yes	Yes	Yes	
English River	Yes	Yes	Yes	
Flying Dust	Yes	No	Yes	-Not all garbage in trench -New trench needed
Island Lake	Yes	Yes	Yes	
Joseph Bighead	Yes	Yes	Yes	
Makwa Sahgaiehcan	Yes	Yes	Yes	-Road needs grading -Trench not always used
	Yes	Yes	Yes	-Site near #26 highway
Poundmaker	Yes	Yes	Yes	
Thunderchild	Yes	Yes	Yes	-Access road requires improving
Turner Lake	Yes	Yes	Yes	
Waterhen	Yes	Yes	Yes	

PRINCE ALBERT ZONE OF MEDICAL SERVICES

Reserve	Regular Community Collection Service	Adequate Site Operation & Location	Old Sites Adequately Covered	Comments
Big River	Yes	No	No	-Ban open dumping
Black Lake	Yes	Yes	Yes	-Good site
Cumberland				-An off reserve site is used
Pond du lac	Yes	No	-	-This site is within 100 m. of lake
James Smith	Yes	No	No	-Surface dumping unacceptable
Lac La Hache	-	Yes	Yes	-Fence needed
Muskoday	Yes	Yes	Yes	-Operation satisfactory
Pelican Lake	Yes	No	Yes	-All-weather road needed -Ban open dumping
Red Earth	Yes	No	Yes	-Trenches are needed to eliminate surface dumping -Rat problem
Sandy Lake	Yes	No	No	-2 new sites are satisfactory -Old sites not covered
Sheal Lake	Yes	Yes	No	-Old site not properly covered -Using site off reserve
Sturgeon Lake	Yes	No	No	-Dump located only 60 m from homes -Fence needed to control litter -Dump not properly maintained
Wahpeton				-Reserve uses Prince Albert landfill
Witchekan Lake	Yes	No	No	-All-weather road needed -Potential rat problem at abandoned site -New dump site trenched into ground water table